Vol. 2 No. 8 AUGUST, 1984

DATA BRIEFS...

○ **Computer ESP predicted.** think a command and your computer executes it — it's not so far off, according to International Resource Development, Inc., a Norwalk, Conn.-based market research firm. Direct brain/computer connection may soon result from existing research coupled with the development of non-keyboard data entry for military control systems. The early PC/brain interfaces will probably be several electrodes placed on the user's neck and temples, similar to lie dector technology. But by the mid-1990s, they will be replaced by human "biochips."

○ **Annual reports on diskettes** may soon be the standard corporate format. Paving the way is Intelligent Systems Corporation, a manufacturer of personal computer enhancement products. Its printed 1984 report is complemented by a floppy disk which can be entered into shareholders' and financial analysts' PCs. Financial, operations and market research data appear on the diskette in the form of text, color graphics and spreadsheets. The diskette requires IBM DOS 2.0 or Apple DOS 3.3.

○ **Easy-to-guess "dumb" passwords** leave your PC files exposed to penetration, says Arthur D. Little security specialist John Wilkinson-Heap. His roster of obvious personal identification code words includes family names ("ex-spouses, maiden names and nicknames"), home addresses, alma maters, favorite sports teams, movie or TV stars, or Social Security numbers.

○ **Enternet** is a local, interactive, multi-user system — faster and cheaper, it is claimed, than national packet-switched networks such as CompuServe or The Source. Plans are to establish Enternet systems in major U.S. cities after Miami area testing. The Miami tests involve *Fazuul,* an interplanetary adventure game for up to 45 players simultaneously (vs. six players for multi-user, national network games.) Singly or in groups, the players explore an alien city to find their way off the planet on which they have crashlanded by asking questions and analyzing clues.

(continued on page 5)

BARON'S MicroComputing REPORTS

Saving the disk ..... page 1
Modem terms explained ..... page 1
Two low-cost hard-disk champions ..... page 4
Hands on review: Kaleidoscope ..... page 5
Second Computers: WorkSlate ..... page 6

SAVING THE DISK

Using disk recovery programs

You sit down at your computer, ready to run an important job. As you attempt to boot up the program, the disk drive makes peculiar noises and a message appears indicating a problem with your diskette. There is vital information on the diskette, and you *know* it worked fine the last time you used it. Is there any way of fixing it, you wonder, to recover the information so that you won't have to completely reenter the program and/or data?

As reliable as floppy disks have proven to be, this scenario is not unusual. A single back-up diskette may not be enough protection for storing important programs or data. Depending upon the volatility of your data (i.e., how often it is changed and/or updated), you may be wise to maintain a series of back-up files. However, even a back-up has been known to fail.

Fortunately, it is sometimes possible to "resurrect" a bad disk. With special disk recovery programs, you can attempt to reconstruct the data on a bad disk and recover a seemingly lost program.

How they work

Disk recovery programs have the ability to "undelete" deleted files under

(continued on page 2)

Modem Terms Explained

Finding your way in telecommunications

Understanding communications terminology will smooth your way into the world of electronics. This applies to the use of modems in general and particularly to establishing the protocols of your communications program.

The term, *baud rate,* is derived from the name of Emile Baudot who invented the teleprinter code in 1874. It is the speed at which a modem sends data to the screen.

Baud rates vary from 50 to more than 9600 bits per second. But for practical purposes, you'll be interested only in rates of 300 and 1200 baud, the popular standards for modems. At 300 baud, text is delivered at about five words a second, quite a fast speed. A 1200-baud transmission is roughly 20 words a second. At this rate, message fairly whip across the screen.

Most modem communication today is done at 300 baud. In fact, the majority of computer bulletin boards, the free, privately-run data bases, only operate at 300 baud. Commercial data bases can transmit at both speeds though they charge more for 1200 baud communication.

Another term you'll also need to understand when buying or using a modem is *full/half duplex.* Half duplex means that communication can flow in

(continued on page 3)

SAVING THE DISK *(continued)*

certain circumstances. When you request a file to be deleted, the disk operating system does not actually erase the file. Instead, it flags the file's entry in the directory (or catalog) with a deletion code. If you add a new file to the disk, the operating system may write the new file over your deleted file, depending upon its space requirements. Once this happens, the deleted file is permanently lost. However, if no further changes were made to the disk, a disk recovery program can "unmark" the directory entry. The result is you regain access to a file which you previously deleted.

There are a variety of functions which you can perform with disk recovery programs to help you recover files or data. Some permit you to read a diskette's contents sector by sector, rather than file by file. By inspecting the actual contents of the diskette, you can check where each file resides on the diskette and whether data stored on a "blown" diskette is still there. Some programs display a sector-by-sector schematic of the entire diskette. You can find out where each file is located, how many and which sectors have been allocated to each file, and where the directory (or catalog) of the diskette is located. This information can be crucial for assessing whether or not files can be recovered. The contents of the diskette is usually displayed in either character or hexadecimal (ASCII) format.

Many of these utility programs also allow you to dynamically change the contents of the diskette byte by byte. Should you find a sector with a few bad bytes, you can correct the contents if you know what it should be. Also, by changing certain bytes within the diskette's directory, you can alter the characteristics of your files. For example, you can hide a file or protect it, or undelete a file which has been flagged for deletion.

Know what you are doing. Disk recovery programs are not to be used by novices. Although documentation is often excellent, if you don't have some experience, it is easy to make a bad situation even worse.

Keeping a disk recovery program on hand just in case is a wise measure; you never know when a good disk may go bad. Once you've corrected a seemingly uncorrectable problem, you will surely appreciate its value. It may very quickly pay for itself. But remember, even disk recovery programs cannot always salvage a damaged disk.

– Harry & Ronni Geist

Some popular disk recovery utilities:

APPLE

• **Apple Mechanic.** *Beagle Bros., 4315 Sierra Vista, San Diego, CA 92103, $30.* "Byte Zap," included in this package, can rewrite any byte on a disk for repair or alteration; restores deleted files; displays data in hex, decimal, or character format.

• **Bag of Tricks.** *Quality Software, 6660 Reseda Blvd., Suite 105, Reseda, CA 91335. $40.* In addition to standard functions, this package includes programs that rearrange files to improve the access time for DOS diskettes, locate and fix an I/O error, and reclaim disk tracks not used by Apple DOS.

ATARI

• **DISKEY.** *Adventure International, Box 3435, Longwood, FL 32750. $49.95.* DISKEY can examine a disk and its directory, repair files, and list destroyed or unreadable sectors.

• **DISKSCAN.** *David Young, 421 Hanbee, Richardson, TX 75080. $39.95.* In addition to standard features, DISKSCAN can search a file or an entire disk for specific one- or two-byte sequences. This package's line assembler can modify machine-language object files.

COMMODORE

• **The Clone Machine.** *Microware Distributing, 42B Route 23, Butler, NJ 07405. $49.95.* As described in the April, 1984 *BMR* Commodore report, this backup utility has the ability to inspect data sector by sector and deliberately create bad sectors on a disk.

• **DISKEY.** *See Atari.*

CP/M

• **dataCURE.** *Colorado Online, 40 Balfour Lane, Ramsey, NJ 07446. $109.* Creates four files of supplementary information on newly formatted disks which are used during recovery procedures. The utility regenerates tracks or sectors.

• **Disk Doctor.** *Supersoft, Inc., P.O. Box 1628, Champaign, IL 61820. $100.* Restores accidentally erased files and recovers information from "crashed" diskettes.

• **DPatch.** *Advanced Micro Techniques, 1291 East Hillsdale Blvd., Suite 209, Foster City, CA 94404. $195.* This disk-error and recovery package includes a routine to provide a complete surface analysis of a diskette. Bad areas can be marked so that CP/M will not attempt to read them.

• **Inspect VER-1.** *Computer Services, 1050 East 800 South, P.O. Box 233, Provo, UT 84603. $75.* In addition to standard features, this package allows you to change user numbers and enables you to rebuild directories.

IBM

• **Disk Mechanic.** *MLI Microsystems, 50 Hunt St., Watertown, MA 02172. $69.95.* This program copies protected software and includes utility functions for examining and repairing disks and directories.

• **The Norton Utilities.** *Peter Norton, 2210 Wilshire Blvd., Santa Monica, CA 90403. $80.* Included in this package are utilities to hide, sort, and restore erased files, and to examine in detail the structure of a diskette.

• **The Ultra-Utilities.** *The FreeSoft Company, P.O. Box 27608, St. Louis, MO 63146. $40 for freeware registration.* This is a freeware package containing three programs: Ultra-Zap, Ultra-Format and Ultra-File. Ultra-Format can be used to repair damaged disk tracks and to recover the lost data.

TEXAS INSTRUMENTS

• **DISK FIXER.** *Navarone Industries, 510 Lawrence Expressway, #800, Sunnyvale, CA 94086. $39.95.* Cartridge-based utility which reads, prints and dumps sectors. Recovery is by sector, byte or character string.

TRS-80

• **DISKEY.** (for Color Computer) *See Atari.*

• **SUPER UTILITY PLUS 3.2.** *Powersoft, 11500 Stemmons Fwy., Suite 125, Dallas, TX 75229. $79.95.*

WANTED... WANTED... WANTED

Freeware, public domain software announcements. will selectively publish information concerning new no-charge or suggested-donation application software for Apple, Atari, Commodore, IBM, TI, TRS-80, CP/M and MS-DOS computers. Send announcements — including charges or donations, and full ordering address — to *Freeware/Public Domain Software Editor, Baron's MicroComputing Reports, 344 E. 49th St., New York, NY 10017.*

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Modem Terms Explained *(continued)*

only one direction at a time. Home intercoms are an example of half duplex. Full duplex accommodates data travelling back and forth. Telephone conversations, for example, are full duplex communications. Most modems feature full and half duplex but there are some that only have full duplex. This is not as much of a drawback as it would seem because your software can set a half duplex mode from full duplex. But modems that only feature half duplex capacity are not advised. Most data bases need full duplex to communicate with your modem.

Years ago, when Ma Bell assigned certain tone frequencies to code the "1" and "0" bits, another modem term was created, *compatibility*. It refers to the tone frequency assigned to a bit. "Bell 103 compatibility" indicates the tone frequency that has become the standard for 300 baud modems. Bell 212A — or Bell 212 (the "A" is often dropped) — is now the standard for 1200 baud modems. There are other standards, too, so if your modem also has Racal-Vadic, Bell 113 or Bell 202 compatibility, consider it an extra benefit. But what you cannot do without is Bell 103 compatibility for a 300 baud modem, and Bell 212A for a 1200 baud modem.

The *answer/originate* mode is controlled by the software being used or a modem switch. When you place a call in the originate mode, your modem automatically sends out one set of tones and prepares to accept another. Meanwhile, the answering modem (answer mode) gears up to receive your set of tones and to send the other set. If both modems are in the same mode, neither will be sending or receiving the tones they expect. Should this happen, the units will briefly snarl at each other and then break contact. So when transmitting to a friend, first arrange who will be in answer mode and who in originate mode. (Data bases and bulletin boards are in a perpetual answer mode. To call them, switch to originate mode.)

A pair of terms that also pops up is *synchronous* and *asynchronous*. Synchronous data transmission is high baud and precisely timed. Asynchronous transmission is data sent in sporadic bursts as happens when you type at a console. It is rare for a modem to have both capacities; if it does, so much the better. But asynchronous transmission is a must.

Getting your modem on line involves three related terms: *stop and start bits, parity and bit length.*

Stop and start bits: Each eight-bit group, or one byte, that leaves your modem has an additional bit added to it at the beginning. This is the start bit and it signals the beginning of a byte to the receiving modem. Added on to the end of each group is another bit — the stop bit. It signals the end of the byte. Because some older teleprinters require a two-stop bit signal, there is some software that provides it as an option. Chances are you'll never need to use it. In fact, most systems simply add one start and stop bit without even mentioning other options.

Parity is a measure of transmission accuracy. Any software above kindergarten level lists parity checking as one of three protocol settings: Odd, Even or No Parity. The actual setting doesn't matter as long as the two computers have the same setting. Parity uses the eighth bit of a byte, so if you want parity checking, the eighth bit has to be kept free for that purpose.

Bit length: To free up the eighth bit, you use another protocol setting called bit length, word length or other words to that effect. Set bit length at 7 if you use parity checking. If not, use a bit length of 8. But note that the bit length setting of the sending and receiving computers must be the same or the message on your screen will resemble the random chattering of monkeys.

So what is the advantage of parity checking? That depends on the software. A program may command a repeat transmission of a faulty byte; or it may flag the error with an asterisk or other mark; or it may do nothing — which is so often the case that "No Parity; 8-Bit" is the most commonly used setting.

Although most transmission of computer data over voice lines is carried out at a 300-baud rate, current trends indicate that progressively higher speeds are becoming the norm. Already, the number of 1200-baud modem users almost equals that of 300-baud users for some applications such as specialized business data networks. In these cases, the advantage of high transmission speeds outweighs its higher cost — generally between $200 and $300 more.

The trend toward faster modems is not likely to stop at 1200 baud. The next step up is 2400 baud. Specialized news networks are already providing or experimenting with 2400-baud access. Spurring the shift to higher speeds is the growing interest in PC-to-mainframe communications. (Mainframes routinely communicate with each other at 9600 baud.)

Prices of 2400-baud modems currently run from $800 to $2,000 compared to $300+ for a 300-baud unit, but the tendency is for the cost of hardware to decline rapidly as its availability and use grow. Among the 2400-baud modems available this year are the following:

- **Codex 224 Data Modem** *$1,195 - Codex Corp., 20 Cabot Blvd., Mansfield, MA 02048. 617/364-2000.*
- **CDS 224 Autodial** *$1,195 - Concord Data Systems, 303 Bear Hill Rd., Waltham, MA 02154. 617/890-1394.*
- **M8822/24 (two channels)** *$2,050 - Micom Systems, 20151 Nordhoff St., Chatsworth, CA 91311, 213/998-8844.*
- **Rixon R2424** *$1,395 - Rixon Inc., 2120 Industrial Pkwy., Silver Spring, MD 20904. 301/622-2121.*
- **Universal Data Systems 201C (dial-up)** *$775 - Universal Data Systems, 5000 Bradford Dr., Huntsville, AL 35805. 205/837-8100.*

INSIDE INFO

▸ What is the difference between a local area network and a multi-user network?

Local Area Networks, or LANs, enable users to make use of a limited number of peripherals or software programs. For example, the same printer can be used by two or more people — though it must be at different times. The second user must wait until the first is finished, and so on. Essentially, the same holds true when two people access the same data file; the second user is locked out of the system until the file is free. Even when two people attempt to load the same program from a hard disk system to different micros, the second user's program loads only after the first is finished.

Multi-user systems, on the other hand, tend to be software-oriented. They enable many users to access the same software simultaneously. Two people can work on the identical file as long as they are updating different records.

Which of the two networks is better for you depends on your needs. However, one factor to be aware of is that if a multi-user system crashes, the entire system is inaccessible; if a terminal goes down in a LAN, only that terminal is affected.

(continued on page 5)

Two Low-Cost Hard-Disk Champions

Kaypro 10 vs. Morrow Micro Decision 11

Last year, Kaypro Corp. created a stir with the Kaypro 10, a transportable computer with a hard-disk drive at a price drastically lower than similar products from other manufacturers. A reevaluation of long-held tenets about the pricing of hard-disk systems and their reliability in portable environments took place. This year, Morrow, Inc. has begun selling the Micro Decision 11 (MD-11), a unit similar in a number of ways and differing, superficially at least, mainly in its lack of portability. In both cases, the hardware is bundled with an array of software. The price of the two units (just under $3,000) is close enough so that the prospective purchaser can concentrate on what each package really offers.

In this issue of *BMR* we will focus on the MD11. Next month we will examine the Kaypro 10 and discuss reasons for choosing one or the other.

The Hardware

The heart of the MD-11 computer is an 8-bit processor, a Z80A running at 4 MHz. The system includes 128K of RAM; an 11 megabyte (formatted) hard disk; a double-sided floppy drive (384K formatted); a Centronics parallel port for a printer and three RS-232C serial ports. One is reserved for the terminal; another can connect a printer or modem. The last, marked AUX, can be used similarly but is not currently supported by Morrow system software. An RS-422 port, intended for high speed synchronous communications, particularly with mainframes, is currently unsupported by the CBIOS. There is some expansion capability; the disk drive controller can support an additional hard disk and a second minifloppy drive. There is also a 40-pin connector which could be used to hook up some additional boards.

The Morrow-supplied MDT-60 terminal consists of a CRT, best placed right on top of the computer, and a detached, Selectric-style keyboard with 13 programmable function keys. Morrow-supplied software includes sets of keys for each application program, and allows the user to modify and create new ones. The keyboard has an excellent feel — a touch-typist will have no problems with it. Graphics are available on MDT60, but Morrow supports them to only a limited extent.

The Software

Like other models in the Morrow line, the MD11 comes with a full assortment of programs, most already on the hard disk (backup distribution diskettes are provided). The centerpiece is the CP/M 3.0 operating system and a large number of utility programs. Perhaps the most important of these is BACKFIELD, a set of programs for backing up the hard disk onto floppies which allows incremental as well as full back up — a very good feature for a hard drive-based system. Another utility allows the MD11 to read and write (not format) several other popular disk formats.

As for the application software, NewWord, nearly identical with WordStar/MailMerge in its user interface but with some added useful features, is provided for word processing. Correct-It is the accompanying spelling checker. SuperCalc is the featured spreadsheet: a good choice, although the version bundled by Morrow is not the latest version (SuperCalc 2) available for some other CP/M-based computers. Data base handling needs are addressed by Personal Pearl, not a powerhouse but very user friendly and very flexible. The Quest bookkeeping system is a complex program for Accounts Receivable, Cash Disbursements, and General Ledger. There are three programming languages: Microsoft Basic, Bazic (a NorthStar compatible version of Basic) and Pilot (easy to learn). Given the wealth of software already provided, most business users are unlikely ever to need these.

Working with the MD11

In general, a pleasure for both a novice and an experienced user. Four factors contribute to this. One is the hard disk itself: the "floppy shuffle" is gone and one stops worrying about running out of disk space when creating a database (a mistake in theory, since the 16 user areas implemented on the hard drive place limits on file size, though rarely in practice). The second is the sheer speed with which data is accessed on the disk and brought to the screen. This is achieved by a combination of the hard drive itself with Least Recently Used buffering provided by the operating system. In practice, the effect is very close to what is provided by an electronic RAM disk. Third, for the new user, Morrow has implemented a very complete system of menus (Co-Pilot), which allows a new user to work with the application programs almost immediately, without going through the bother of learning the operating system. Such menu-driven front ends are often a bother when one gains experience; however, the speed of the MD11 makes them quite palatable in most circumstances, and one can easily escape to the operating system when necessary. Finally, there is the very sophisticated operating system. If one needs to do programming, it provides an excellent environment in which to work.

Documentation

The main application programs have been provided with separate documentation by their manufacturers. Digital Research has supplied an impressive set of quite readable manuals: most users will not need to go beyond the User's Guide.

Morrow itself has provided the MD11 User's Guide. It contains an overview of the system and the software, a tutorial on getting started, and answers to some standard questions from new users. Other Morrow documents include a technical discussion of the BACKFIELD system, updated material on the function keys, and Micro Decision Questions and Answers, intended to deal with problems concerning all the MicroDecision computers.

While it reads very well, the Morrow documentation is the weakest part of the whole package. To give an example: although the Guide emphasizes proper procedures for handling the hard disk before shutting off the computer, it fails to treat the RESET key properly — information about it is slipped in casually. The key itself is very small, placed very low in front of the computer, and is unmarked. One of the users who worked with the review model initially did not see it, tried to use the separate RESET key on the keyboard which does *not* reboot the system and, until he figured out the answer after searching through the documentation, several times got out of a computer "lock-up" by turning the power on and off — obviously, without being able to go through the safety procedure.

– Henryk Baran

Inside Info *(continued)*

▸ What is an overlay?

An overlay is a portion of a program that is not immediately booted into memory — either because it is not heavily used or because the programmer wishes to conserve RAM for processing. When it is finally loaded, it is sent to the same memory location as that of another piece of code already in residence. Since two different items of code cannot occupy the same location, the original code is overlayed and replaced with the new code. Overlays are usually specific modules in an applications program that provide special features such as help menus and printer drivers.

▸ What are the advantages of pipes?

Piping is an operating system feature that enables the user to redirect input from a device other than the keyboard. For example, if you are creating a graph, you can direct the program to accept data from another file through the use of pipes. You can even have one program generate the input for another program. In the first case, you are substituting a previously created file for the keyboard input. In the second case, you are merging two programs so that they act as one. The advantages are self-evident — pipes free the user for other tasks.

▸ If most home computers support only 40 columns, how can some word processing systems provide 80-column displays?

There are two methods for getting a 40-column home computer to display 80 columns. The first is to install an 80-column card inside the computer or its expansion box. With this add-on circuit the computer can display a full 80 columns of text on the screen at all times. The second method is to simulate 80 columns through programming techniques. In this case, the program flips back and forth between two or more screens of text. However, there never are more than 40 columns displayed on the screen at any one time out of the 80 columns which may be shown. ●

DATA BRIEFS... *(continued)*

Knowledgeable players may guide neophytes — for a fee paid in "crackers," each worth three cents. Playing the game costs one cracker per minute for 300-baud, or two crackers for 1200-baud modem users, or $1.80 and $3.60 an hour. (Hourly rates for network multi-user games generally start at $6.) Miami area residents can sign up for Enternet by dialing *866-8060*. ●

Hands On...

• **KALEIDOSCOPE.** *DBi Software, One Energy Place, 5805 East Pickard Road, Mt. Pleasant, MI 48858, 517-772-5055. Available for IBM PC, most CP/M-based micros, TI Professional and Victor 9000. $695. (Reviewed on a Morrow MD-11.)*

The makers of Kaleidoscope claim that it is more than a relational database management system and an applications generator. They feel it is a "shining" example of "Fourth Generation" software. And in many ways, it is. In some respects, however, Kaleidoscope is a throwback to the time when "user-friendly" was unheard of.

The package is comprised of five distinct modules: The SystemPac, which includes the relational database management system; The Advanced SystemPac, which features the DATA BASic language; The Systems Designer, which creates integrated applications programs; CalcMerge, which interfaces with many of the popular spreadsheet programs; and DataMerge, which inserts data into WordStar and Word Perfect documents.

Kaleidoscope's power resides in a relational data base capable of keeping nine files open at any given time. It has the ability to define over 32,000 records per file and 180 fields per linked file. In addition, subsets of files are easily created and manipulated.

To create the actual data base is relatively simple. At the appropriate prompts, you inform the program of the total number of character and numeric fields. It then prompts you for each individual field name and size. At this point, the package's unfriendliness first becomes apparent. If you enter any of the menu selections by mistake, you cannot exit neatly because the Escape key is disabled. You have to crash the program and then reload it.

Designing a screen for input or updating is not a simple task either. Because you have to enter a coded number for the placement of the entry on the screen, you first have to plot the screen layout on specially prepared graph paper. Once the appropriate data is entered in the definition screen, you can toggle to the display screen and see the fruits of your labors. If you attempt to design the screen "on the fly," you may have to re-edit it several times until the fields and headings do not overlap.

With Kaleidoscope, you can develop report programs to whatever criteria you specify with DATA BASic, a programming language with 30 commands based on MicroSoft Basic. Once written, the program is compiled and then run. Any syntax errors are noted for later debugging. It is also possible to integrate actual Basic code into your program, thus supplying you with additional power.

The DATA BASic language frees you from coding many of the elementary functions, such as the opening and closing of files. However, this advantage is undermined because you have to learn a new set of mnemonics even though the original commands would have served just as well. For example, the loop commands, rather than being FOR and NEXT are RPL and NEXT. Why RPL? Because it stands for Report Program Loop.

By comparison to most of the other modules, the System Designer is fairly straightforward. It creates an integrated system by generating a menu that includes your previously written and compiled programs.

Contrary to what DBi claims, Kaleidoscope is not for novice users. If you are a programmer, Kaleidoscope has more than enough features to satisfy your needs. But, if your main interest is in achieving results, getting involved with the program's report generator may require more of a commitment than you are willing to make. ●

PC Money Talk

• **Shareholder freebies.** To attract investors, more and more corporations are providing stockholders with free or discounted merchandise or services in addition to cash dividends. A new service called *Shareholder Freebies* tells CompuServe subscribers which corporate sugar daddies are doing the offering. Typical freebies include a 10% discount on accommodations at a large hotel chain; a product sample package from a national supplier of health care products; a 10% discount in a corporation's electronic stores; and $145 off a three-piece luggage set and up to 35% off brand-name reading lamps provided by a large producer of juices and fruit drinks. The standard connect rate fee for Shareholder Freebies is $12.50 per hour between 8 a.m. and 6 p.m. weekdays, and $6.00 at other times. *CompuServe, 5000 Arlington Centre Blvd., P.O. Box 20212, Columbus, OH 43220. 614/457-8600.*

• **Donoghue Organization investor data base** provides information and commentary on money markets, mutual funds, and other investment opportunities such as gold, IRAs and Keoghs.

(continued on page 6)

PC Money Talk *(continued)*

The data base can be accessed on-line by members of The Source. (The Donoghue Organization publishes the *Moneyletter* and *Money Fund Report* newsletters.) Charges are standard connect-time rates of $20.75 per hour weekdays, and $7.75 at all other times.

• **Congress cuts PC purchase tax breaks.** Business tax deductions, which users have counted on to defray 30% to 50% of the cost of their PCs, will be disallowed or reduced in 1985. For those who are required by their employers to own a PC, or who use their PC for their business or freelancing activities, the first-year write-off has been raised from $5,000 to $7,500 in 1988. (It will go up to 10,000 in 1990.) However, if 50% or less of your PC's use is for business (including management of personal investments), neither the immediate write-off nor the accelerated five-year depreciation (including investment tax credit [ITC]) will be allowed. Instead, PC owners must depreciate on a straight-line basis over 12 years without ITC. What this amounts to is nearly 70% less in first-year tax savings. In all cases, taxpayers must keep a log of PC use. Where use is mixed, they can claim deductions only on a pro rata basis.

• **Morrow economy word processing systems.** Two reduced-cost Micro Decision CP/M hardware/software computer systems are being offered by Morrow, Inc. to users whose primary application is word processing. Both systems feature a monitor and detachable keyboard, NewWord word processing system, and 5 ¼-inch disk drives — a single-sided, double-density drive on the MD1E ($999) and two double-sided, double-density drives on the MD3E. The latter, down to $1,499 from $1,899, also includes the Correct-It spelling checker.

The offer is based on Morrow user studies indicating that 53% do word processing daily, and 29% at least three times a week. In contrast, daily use of spreadsheets was only 5.4% and database managers, 7.2%. Three-times-a-week use was 16.2% (spreadsheet) and 16.4% (database manager). *Morrow, Inc., 600 McCormick St., San Leandro, CA 94577. 415/430-1970.*

• **Do you want to trade your PC hardware/software?** A monthly newsletter, *Trade-a-comp/Trade-a-disk*, addresses buyers, sellers or traders of new or used PC hardware and software. Ads must contain at least 20 words, and each word costs fifteen cents per issue. Subscription rates are $18 a year or $10 for six months. *Trade-a-comp/Trade-a-disk, POB 671, Bethel Park, PA 15102.*

Second Computers

• **WorkSlate** *($895)* is unique in that it is designed for a specific task — spreadsheeting. If an application has to do with number crunching, WorkSlate shines; if it is word-oriented, a crayon and paper bag might be better suited.

WorkSlate operates on four AA batteries which are good for 30 hours after a recharging. It comes with 16K of RAM, 64K of ROM, and built-in features such as a 300-baud modem, a speaker phone, a real-time clock and a microcassette. It stores all information in spreadsheet format and holds up to five spreadsheets at a time in memory. Three of them — a phone list, a memo pad and an appointment calendar with an alarm feature — are present as soon as you turn the system on.

Although the 16-line by 46-character LCD may seem small at first glance, it does allow for windowing. A status line at the top displays the name of the worksheet being used, the formula, text or constant in the cursor-flagged cell, any peripheral in use, the amount of RAM used, the date, and the time. Applicable options appear on a line across the bottom of the display.

For most users, WorkSlate's biggest drawback is its small keyboard. Standard typewriter keys would be too large. Instead, the 59 keys (five are programmable) resemble plastic aspirin tablets.

WorkSlate has two unique function keys. The worksheet key displays the spreadsheets in memory, and the option key offers 14 functions including set up, sort, window, copy, display, format, draw and insert. Other features — such as find, print, save, recalc and get — are accessible by pressing the special key (WorkSlate's answer to the control key) and one of the alphanumeric keys.

The five function keys (available via the special key) are: calc, finance, memo, phone and time. The calc feature enables a calculator in a window across the bottom of the screen. The finance key allows use of built-in depreciation, loan and NPV (Not Present Value) formulas. The memo key, not to be confused with the memo pad, controls access to the cassette player.

Each spreadsheet is labeled from A to ZZ and 1 to 128. The screen displays up to 56 cells of a standard-size spreadsheet at any given time. Text and constants entry are normal and formulas are preceded by a depressing of the shift key and the formula key. Movement through the spreadsheet can be done by individual cell, by screen size, or by spreadsheet size.

WorkSlate comes with two prerecorded tapes, "Teach Me Now" and "Teach Me Later," with an audio and a digital track. The tutorials can walk the user through various exercises. The ability to record voice with a text file is another of WorkSlate's advantages. Managers can orally comment on any portion of a spreadsheet or use the unit as a dictating machine.

Tapes are automatically rewound when they are first placed in the system, and programs are loaded by using the special and the get keys and then answering the prompts on the screen. Each side of the tape can hold up to five programs or worksheets.

BMR tested two of the 21 TaskWare financial packages that are available (at $49.95 each) for WorkSlate: *Travel* and *Loan Analysis*. The eight worksheets in the *Travel* program include Itinerary, Expense Reporting, Airline Mileage Log, and Foreign Currency & Metric Conversions. Except for the Conversions, the worksheets tend to be much too general. (In fact, they could be easily constructed by most users.) For example, the Expense Reporting worksheet consists of a list of possible expenses with room for up to a week's worth of actual exenditures. The program computes whether the company or the traveler should be reimbursed; however, the same result can be obtained with a standard spreadsheet or the calculator function.

Loan Analysis, on the other hand, is more useful. Among its templates are two amortization schedules (yearly and monthly), a comparative interest rate analysis, a personal financial statement, and two internal rate-of-return worksheets (annual and monthly). Both the Loan Analysis and the Travel package are weakest in their documentation: it is far too short.

The worksheets can be printed on a four-color thermal microprinter ($250) either vertically for the usual 40 columns or sideways for 80 columns. Other features include: color printing (red, blue, green and black), compressed type, partial worksheet printout, and row/column headings. Because the printer contains a buffer, the user can move on to other matters while a worksheet is printed out.

All in all, WorkSlate is a useful and well-designed lap computer for the dedicated spreadsheet user. *Convergent Technologies, Inc., 2441 Mission College Blvd., Santa Clara, CA 95050.*

TOOLS AND CONCEPTS

• **If you have an IBM PC, how about a PCI?** IBM will introduce an upgraded PC model this summer according to industry analysts. Based on the Intel 8088-2 chip, the PCI version will have twice the clock speed of the PC (8 MHz). This will enable it to effectively use windowing software such as VisiOn which now runs very slowly on the PC — and also the yet-to-be introduced IBM *Glass* package. PC users will be able to convert to PCI by replacing their 8088 chips.

• **Chessell Robot Plotter** is a freestanding 4-inch-square device which moves a pen on paper of any size to produce line graphics in three colors with ±0.5% plotting accuracy. Drawings to be plotted are described by a simple control code from a personal computer. The XY coordinates then go to the robot plotter which calculates the exact movements that its pen has to execute to reproduce each specified line. The robot keeps track of its position and direction at all times and aligns itself with the paper's edges. When the drawing is completed, the plotter finds its way "home" to the corner of the paper. The British-made device will retail for about $450 when it is distributed in the U.S. in late 1984. *Marketing Network, 13324 Glenwood St., Sherman Oaks, CA 91423. 818/906-1066.*

• **Personal computers — two good deals?** Sometimes the manufacturer's name is sufficient to focus universal attention on a new computer model, whatever its actual merits. That is true of IBM, and it is also true of AT&T which has just introduced its first true personal computer — best described as "IBM-compatible." Another new machine, the Amiga PC, is also IBM-compatible. It has attracted tangible interest on the basis of price and capabilities trade-off.

AT&T Model 6300 runs nearly all IBM software, comes with two 360K floppies, and its basic price is $200 lower than Big Blue's $2,950. One difference between the two machines appears to be that the AT&T system uses an Intel 8086 microprocessor with a 8 MHz clock speed, twice of that of the IBM. The Model 6300 also comes with 7 expansion slots, RS-232 and Centronics ports, and 640 x 400 high resolution proprietary, color and monochrome graphics. A 128K Model 6300 (expandable to 640K) costs $2,745; a 256K version with a 10MB hard disk lists at $4,920.

A more important difference is the machine's ability to hook into local area networks and link with other PCs, peripherals, mainframes and AT&T's 32-bit computers. (IBM is, by its own admission, as much as three years away from providing LAN capabilities.) With an AT&T PC Interface ($100), the Model 6300 can be used in multiple-user environments. Through the use of Context Switching ($100), users can switch between a PC application and terminal emulation without losing their application. Although the computer does not run the AT&T-sponsored UNIX operating system, AT&T spokesmen did say that UNIX is the direction to go.

Amiga personal computer has already attracted favorable mention even though it has not been formally introduced and is not slated for shipment before October, 1984. It has superior graphic capabilities and it is leanly priced — between $1,500 and $2,000. The system comes with a minimum of 128K RAM, and a built-in 5¼-inch 320K disk drive. The computer is based on a Motorola 68000 microprocessor with an Intel 8088 co-processor. A custom chip set supports graphics, animation, sound and video display. According to the company, the computer can run up to 85% of IBM software, including major packages such as dBase II and Lotus 1-2-3. Approximately 20 to 25 widely used programs will be available initially. Software support will also include a range of game and educational titles. *Amiga Corporation, 3350 Scott Blvd., Bldg. #7, Santa Clara, CA 95051.*

• **New printer prices continue to shrink.** Three recently introduced dot matrix machines include a new Epson unit which lists for $800, but prints in seven colors, and lower-cost CAL-ABCO and Okidata printers costing as little as $239.

Epson JX-80 dot matrix printer prints up to 160 elite or pica characters per second in any of seven different colors. Special typefaces can be downloaded into the $800 unit's 2K buffer. Other features include dot-addressable graphics capability, proportional spacing, tractor and friction feed and Centronics parallel port. Epson interface boards can be used with serial or IEEE-488 ports. *Epson America, Suite 100, 23530 Hawthorne Blvd., Torrance, CA 95050.*

Legend 800 is a low-cost (under $350) dot-matrix Centronics printer capable of bidirectional printing at 80 cps. In addition to the normal alphanumeric mode, the Legend 800 also functions in semigraphics and bit-image graphics modes. It features a unique square print dot which, according to the manufacturer, results in a typeface more legible than that of many correspondence-quality printers. *CAL-ABCO, 14722 Oxnard Street, Van Nuys, CA 91401, 818/994-0909.*

Okimate 10 is a low-cost ($239 list) thermal-transfer, dot matrix printer, Okidata's first mass market unit. It comes bundled with software and accessories. Okimate 10 prints on either ordinary or thermal paper and operates at 60 cps with either Atari or Commodore computers. It will soon be adapted for Apple and other lower cost computers. *Okidata, 532 Fellowship Ave., Mt. Laurel, NJ 08054. 609/235-2600.*

BMR subscribers can now receive monthly reports for more than one make of computer. The charge for this service (which includes first-class mailing of the monthly newsletter with inserts) is $10/yr. per additional computer make.

Reports are available for:

- **Apple**
- **Atari**
- **Commodore**
- **IBM**
- **Kaypro**
- **Osborne**
- **Texas Instruments**
- **TRS-80**

SOFTWARE MART

• **InfoStar+, version 1.6,** is a $595 relational database management system. New features permit restructuring of an existing data base without the need for reentering data, a data dictionary that allows the user to specify data-entry characteristics, and the ability to access up to 16 files simultaneously. In addition, the program permits 255 fields per record (compared to 32 for dBASE II) and 4,096 bytes per record (compared to dBase II's 1,024). Upgrades are available to InfoStar+ 1.0 and StarBurst owners. InfoStar+ 1.6 runs on the IBM PC (96K).

• **Prospect Tracking** and **Mailing List & Business Letters** are two new application programs that customize InfoStar+. *Prospect Tracking* enables users to set up files, using menus and pre-designed input forms. It also includes a computerized "notebook" that automatically creates "tickler" reports. *Mailing List & Business Letters* handles up to 10,000 names and addresses on a hard disk system and 600 on a dual floppy system. Both programs can integrate with WordStar. *MicroPro International Corp., 33 San Pablo Ave., San Rafael, CA 94903. 415/499-1200.*

• **WORLDMASTER** is a multilingual word processing program that allows printing of documents integrating up to eight character sets. Users may mix English and another language by hitting

(continued on page 8)

SOFTWARE MART *(continued)*

the proper PC function key. The four currently available versions of the menu-driven program are (1) **English-Romance** (sic) **languages:** *Italian, Spanish, French, German, British, Danish;* (2) **English-Arabic;** (3) **English-Hebrew;** (4) **English-Russian.** (The last three versions require graphic boards.) WORLDMASTER runs on IBM PCs and IBM-compatible computers with at least 128K memory, and is configured to run on Epson FX series or letter quality printers. Its retail price is $495. *Emcon Marketing Group, Inc., 366 Fifth Ave., New York, NY 10001. 212/563-0443.*

• **OMNIS** is an upgradeable family of three database programs. *OMNIS 1, The File Manager,* handles basic information mangement tasks such as mailing list and file maintenance, time management, list/letter merging, etc. *OMNIS 2, The Information Manager,* offers multi-screen records, each with up to 120 information items and 12 index files, retrievable via up to 50 criteria. *OMNIS 3, The Database Manager,* is a complete database system. The British-designed OMNIS software runs on IBM PC, XT and compatible computers, and on Apple IIe and III systems. OMNIS 2 and 3 also run on the Apple Macintosh and Lisa. Retail prices are: OMNIS 1, $95; OMNIS 2, $195; OMNIS 3, $295. Upgrades are available for the difference in price plus a handling fee. *Organizational Software Corp., 2655 Campus Drive, Suite 150, San Mateo, CA 94403. 415/571-0222.*

• **DATASAFE** protects the confidentiality of data in your PC files, using DES, an encryption algorithm developed by IBM for Federal computers. Protected data can be transferred by modem between any computers that use the DES algorithm, passwords, or by randomly generated hexidecimal keys for greater file protection. Written in an assembly language, the $135 program resides in 40K of disk space. *IMSI, 633 Fifth Ave., San Rafael, CA 94901. 415/454-7101.*

FREE SOFTWARE

Public domain programs for administration, finances and budgets; CAI; teacher and general programming utilities; simulation; graphics; etc. are available from a library of education-oriented Atari software. Send $1 for listing and order forms. There is a $6 donation per disk or cassette. If you send in a disk with acceptable, unprotected public domain programs, you can trade it for a disk of your choice. *Mr. Gordon P. Bigalke, Garber High School, 213 Pine St., Essexville, MI 48732.*

Words Processed

• **The RS-232 Solution.** *By Joe Campbell, 225 pages. Sybex Computer Books. $16.95, paper.* There is little doubt that the RS-232 standard has caused more problems for computerists than any other facet of a hardware system. Nor can many people dispute that the majority of books presently available on the subject do little more than complicate the matter. Either they gloss over the necessary information or they require an engineering degree to decipher it. Well, this book manages to do what the others attempted to do; that is, explain the inner workings of the RS-232 port and how to use that information to solve incompatibility problems.

The text is divided into two sections. The first deals with defining an RS-232 standard, how it interfaces with UARTs (Universal Asynchronous Receiver/Transmitters), the role of logic levels, and the building of a $15 Interfacer's Toolkit, which enables the user to identify the actual function of the various pins and assist him in making his own interfacing cables. The second part of the book is a series of case studies. Among the interface problems examined and solved are: a Kaypro/Epson hookup, an IBM/NEC connection, and modem interfacing.

The RS-232 Solution is heartily recommended for both the novice and the somewhat experienced.

• **Computer Crazy.** *By Daniel Le Noury. 96 pages, illustrated. Sybex Computer Books. $5.95, paperback.* The majority of cartoons in this collection is sure to bring at least a smile to even the most humorless hacker. Although most of the illustrations play on our fears and fantasies about computers — such as the cartoon labeled "Computers run everything here" which shows cables connecting the computer and the speaker's head — there are a few that deal with other themes. For example, in a three-panel strip showing a cat walking over a keyboard, the computer arrives at the formula, "$E=MC^2$." (Le Noury has also illustrated many other Sybex books.)

• **Microprogrammer's Market 1984.** *By Marshall Hamilton, 224 pages. TAB Books Inc. $12.95, paperback.* This reference work is in the vein of the other "market" books for professionals; that is, it lists hundreds of firms that publish computer software. In addition to the publisher's name and address, the book provides the names of the company president and the person responsible for software acquisition, the computer systems covered, the type of programs solicited, and the payment method — royalty, advance, flat fee, etc. Information about the company itself is also given — for example, how many programs it publishes and its marketing strategy.

The companies are divided into five main sections: Business/Industry, Games, Home Use, Educational/Tutorial, and Utilities. An introduction and an index round out the volume. If you have a program you would like to sell or are interested in obtaining a listing of software companies, you will find this reference book quite handy.

• **The Complete Software Marketplace 1984-85.** *By Roger Hoffman. 236 pages. Warner Software. $17.95, paperback.* Like the *Microprogrammer's Market 1984,* this reference work provides listings of software companies. But it also gives you practical advice on how to publish and sell your program. You will find case studies of successful programmers; examples and explanations of contracts, submission agreements and copyright forms; and general advice on structuring your business and obtaining venture capital. Also listed are software agents, lawyers, translators, distributors, retailers and computer-related trade shows.

If you are a beginning freelancer, this is the book to read. It won't help you with programming, but you will get an idea of the process of bringing it to market.

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PERSONALIZED REPORT FOR: TRS-80

August, 1984 Alan B. Abrahamson, Technical Editor

* SOFTWARE REVIEWS

o CMON: MONITOR 1 DEBUGGER

The CMON monitor is very useful for helping a machine-language programmer debug or modify code. It is well-written, and the menu-driven commands are clear and easy to use. There are some gaps in the documentation which can be an obstacle for a beginner, but those familiar with machine language should have few, if any, problems. CMON is supplied on disk in both low and high-memory versions.

Commands are entered in a single key command sequence with spaces as delimiters between addresses and/or bytes. CMON provides you with the following facilities: ASCII memory dump, BREAKPOINT (1), HEX memory dump, EDIT memory address, FIND data, GOTO address, HUNT address, JUMP to DOS, MOVE memory, TRACE program, PRINT next command, REGISTER set, SYMBOLIC assembly dump, FILL memory, EXECUTE program under CMON control, LOAD from disk and WRITE to disk. The TRACE and EXECUTE modes have alternate commands that allow CALLs to be executed in full. In addition to all this power, you can add two USER DEFINED routines and call them from within CMON. The price is extremely moderate ($23) for its potential. Three State Data, 144534 Turin Lane, Centerville, VA 22020. 301/428-5696.

o BASRUM

BASRUM, a library management system, enables you to store all your Basic subroutines to disk for use in other Basic programs. This is the approach used in FORTRAN and other languages that use a linking loader concept.

Supplied on a special disk, the system requires you to boot it up and choose the file you wish to transfer to your operating system. You then boot your own system, go into DEBUG and execute a transfer utility that was originally loaded from the master disk. The procedure has to be repeated for every file to be transferred. If this procedure is intended to be a copy protection scheme, I found the tedious transfer method to be a great annoyance.

The program performs as promised in all regards. It saves and reloads subroutines to overlay areas or into your Basic code. The particular method is easily chosen via menu control. A demonstration program and short library of six simple routines are provided for testing, although I would think a system this expensive ($149.95) should have several useful routines included in the original library file. BASRUM's most redeeming feature is the ability to call subroutines by name within your program. This feature is standard with some operating systems, such as DOSPLUS 3.5, and should be included in all disk basics.

The manual is professional in its presentation, but examples are sorely lacking. Understanding the concept of the program and using it was easy for me, but less experienced users might have some difficulty.

Do you really need this utility? Probably not. Most programmers I know simply save proven subroutines to disk as separate files. When these routines are needed, they are merged into the main program. In fact, some operating systems like NEWDOS80 allow merging on the run. (This facility is similar to chaining, but in actuality it just overlays one section of code with another that has the same line numbers.) BASRUM may encourage you to use a technique of this type in the storage of your Basic subroutines. If so, the program will

(Continued on page 10)

have some value for you. Wiley, Inc., 841 Bishop Street, Suite B2, Honolulu, HI 96813. 808/531-4314.

* SPEED-UP

Like most of us, you probably bought your computer to accomplish tasks better and faster than by hand. How efficient is your computer? Do you need to speed up its processing time?

Several hardware speed-up modifications have been produced over the years to increase the operating speed of the CPU (Central Processing Unit). These kits call for the CPU to run at a speed that exceeds the design specification of the chip. This does not mean that the speed-up kit will not work, but that you will be taxing the system. The element that benefits least from clock speed-up is the disk access. These I/O (Input/Output) routines are time-dependent; in most cases, you have to slow your CPU back to normal speed in order to have reliable disk I/O. So what is the answer?

The answer is software, and the way it is written. In commercial software, the good programmer has taken efficiency into account. If not, you may be able to modify the program to perform better--if you are an experienced programmer. In your own Basic programs, you can use techniques that speed up programs considerably.

The major loss of disk I/O speed occurs if you allow the operating system to seek out the drive on which to file your data. Therefore, you should always define the drive that is to contain your data files. By doing so, you eliminate the search through multiple directories that most operating systems take to find a matching filename before writing an entry. For example, you would open a file for Write like this: OPEN "R", 1, "TESTFILE/DAT:2", rather than OPEN "R", 1, "TESTFILE/DAT" without the drive specification included in the filename.

In the Basic code itself, a multitude of improvements can be made. Always define all possible variables as integers, since integers operate much faster in Basic than the default condition of single precision. This can best be accomplished by using the DEF statement early in your program; for example, DEF INT A-Z.

In using loops, never define the specific loop variable after the NEXT statement; that is, use FOR X = 1 TO 100: NEXT, rather than FOR X = 1 TO 100: NEXT X. This will give you dramatic differences in execution time since the Basic interpreter does not have to look up the X variable in a table. It merely indexes the last active loop variable. The problems in multiple nested loops that might occur can be prevented by good coding techniques.

Use numeric functions rather than string functions whenever possible. This has a two-fold benefit: it reduces string usage and possible "garbage collection," and numeric functions will operate more quickly than string functions. For example, in the routine:

```
10 INPUT "Choice "; A$
20 IF A$ = "1" THEN 100
30 IF A$ = "2" THEN 200
40 IF A$ = "3" THEN 300
```

Lines 20 through 40 could be replaced with:

```
20 ON INSTR("123",A$) GOTO 100, 200, 300
```

Use multiple statements per line. This saves the interpreter from looking to the next line number before executing the next statement.

Place the subroutines you use most often at the beginning of your program. If you have subroutines that you would usually locate at lines 1000, 2000 and 3000, place them at lines 10, 20 and 30 instead. The start of your program would skip over these lines with something like this: 1 GOTO 100. When you want the subroutine at line 10, issue a GOSUB 10 command. Line 10, of course, contains a return at its end.

Either dimensioning or defining your most frequently used variables early in your program puts the first mentioned variable on top of the variable list.

When the list is scanned sequentially by the interpreter, the variables closer to the top will be found first. Of the two methods of accomplishing this, the preferred is to use the DIM statement since it requires fewer memory bytes. For example, you can dimension the variables X, Y, Z in the following manner: 100 DIM X, Y, Z. This is not a syntax error because these are not subscripted variables. The statement has the same effect as: 100 X = 0: Y = 0: Z = 0, which is the second method.

Try to avoid opening and closing files whenever possible. Random files can be left open without much danger. But you will probably have to open and close sequential files since data loss could be disastrous in the event of a crash. The default condition on most operating systems is three file buffers. If you were using three random-type files, I would suggest that you open them early in your program, keep them open, and use all three—one for each file—rather than using only one buffer and opening and closing the same buffer over and over again. At worst, you would risk the loss of the last 256-byte buffer that was not written to disk at the time of the crash. Normally, this data can be easily reconstructed.

Use indexed files for searching data. This method takes advantage of the operating system's ability to selectively retrieve a record from disk. If you create an index to your data in a sequential file, you can retrieve just the information you desire with only one disk read rather than a search through all the data. (Indexing of random access files is a topic for another columnn, and if there is sufficient interest, I will write about it in the future. In the meantime, there are several books on data file handling and techniques that discuss this and other selective searching methods.)

Massive data manipulation like sorting or memory searching of arrays should be done in machine language. These sort modules can be called from your Basic program, and parameters can be passed back and forth via standard USR calls. If your operating system contains special features such as variable swapping, machine language sorting, special file handling or input processing, use these to your advantage in programming your application.

* PEEKS AND POKES

o Checking printer status: PEEK(14312) Printer condition: Model I ready = 63; Model III ready = 61.

o Checking for arrow key input: PEEK (14400) Arrow pressed: 8 = UP, 16 = Down, 32 = Left, and 64 = Right.

o Checking for time and date - Model I:

```
PEEK(16452) YY of "MM/DD/YY HR:MN:SC"
PEEK(16453) DD of "MM/DD/YY HR:MN:SC"
PEEK(16454) MM of "MM/DD/YY HR:MN:SC"
PEEK(16451) HR of "MM/DD/YY HR:MN:SC"
PEEK(16450) MN OF "MM/DD/YY HR:MN:SC"
PEEK(16449) SC OF "MM/DD/YY HR:MN:SC"
```

o Checking for time and date - Model III:

```
PEEK(16922) YY of "MM/DD/YY HR:MN:SC"
PEEK(16923) DD of "MM/DD/YY HR:MN:SC"
PEEK(16924) MM of "MM/DD/YY HR:MN:SC"
PEEK(16921) HR of "MM/DD/YY HR:MN:SC"
PEEK(16920) MN of "MM/DD/YY HR:MN:SC"
PEEK(16919) SC of "MM/DD/YY HR:MN:SC"
```

o Select Disk Drive, 0, 1, 2 or 3:

```
POKE 14304 , number
```


(Continued on page 12)

* SETTING MEMORY SIZE FROM WITHIN BASIC

Have you ever had the need or desire to protect memory from within your Basic program? Most likely you set the memory protect size from DOS or upon entry to Basic when the Memory size prompt appeared. But you can, if you wish, also do it from Basic. Here's how: Locations 16561 (40B1Hex) and 16562 (40B2Hex) are at the top of the memory locations that Basic looks for in order to establish where your string storage will be located. These locations are in LSB (Least Significant Byte) and MSB (Most Significant Byte) order as are all TRS-80 addresses. Therefore, in order to set memory size to 51,455, you would POKE the location 16562 with 200.

Let me explain the calculation: 200 times 256 equals 51,200. Therefore, the MSB equals 51,200. The LSB would be 255, so that 51,200 + 255 = 51,455. You must enter a CLEAR after you POKE these addresses with their new values, since your Basic must have the chance to re-calculate where the string storage area may be located. On a 48K TRS-80, a small program might look like this sample:

```
10 A = PEEK(16562) : B = PEEK(16561)
20 TM = A * 256 + B
30 PRINT "Top of Memory was ";TM
40 POKE 16562,200 :REM Calculate the amount you want to protect
50 A = PEEK(16562) : B = PEEK(16561)
60 TM = A * 256 + B
70 PRINT "Top of memory now ";TM
80 CLEAR 1000 : REM Clear whatever amount you need.
90 REM Continue with your program now.....
```

* BOOK REVIEW

o LEARNING TRS-80 MODEL 4/4P BASIC, by David A. Lien, 475 pages, $19.95. COMPUSOFT Publishing, 535 Broadway, El Cajon, CA 92021. 619/588-0996.

David Lien is here to the rescue again. Oldtime TRS-80 users (circa 1978) will remember the well-written Level I User's Manual from Radio Shack. Why Radio Shack used someone else for subequent manuals escapes this reviewer.

Are you a novice to computers and the Model 4/4P in particular? Are you unfamiliar with Microsoft Basic? If so, this is the book for you. In a clear, concise and moderately amusing style, Lien tells of the foibles of the TRS-80 Model 4/4P. Reviewers have criticized the Lien humor, cartoons and style in previous books, but I feel they are a welcome relief from boredom that many of us need when trying to learn a new system.

The book is both a learning tool and a reference manual for the use of commands, especially those we all too soon forget. The text covers Basic up to but excluding disk file handling (which should be the topic of a future Learning Model 4 Disk basic book), nor is much said about the disk operating system. This is not a book for professionals or hackers, but the novice should certainly find enough to glean between the covers.